

Civil Engineering 451- Palmer Lake Bridge Design

Civil Engineering 451 - Palmer Lake Bridge Team



Overview

Our Team

Project Overview

Site Reconnaissance

Design Alternatives

Summary

Recommendation

Our Team



Adam Bell



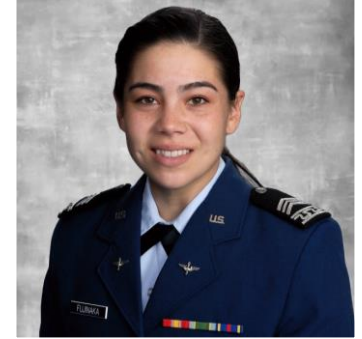
Isiskyra Budd



Nigel Cook



Alise Crabtree



Evelyn Fujinaka



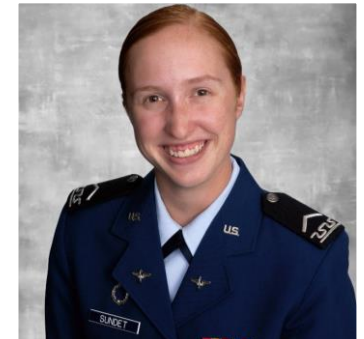
Evan Haskins



Charles Pumphrey



Matthew Serrano



Cayley Sundet

Project Summary



Design Goals

- Designed for pedestrian and biking use
- Connect current trail system to recently purchased land
- Provide a practical creek crossing which is also aesthetically pleasing

Team Progress

- Site recon completed
- Creation of 3 design options

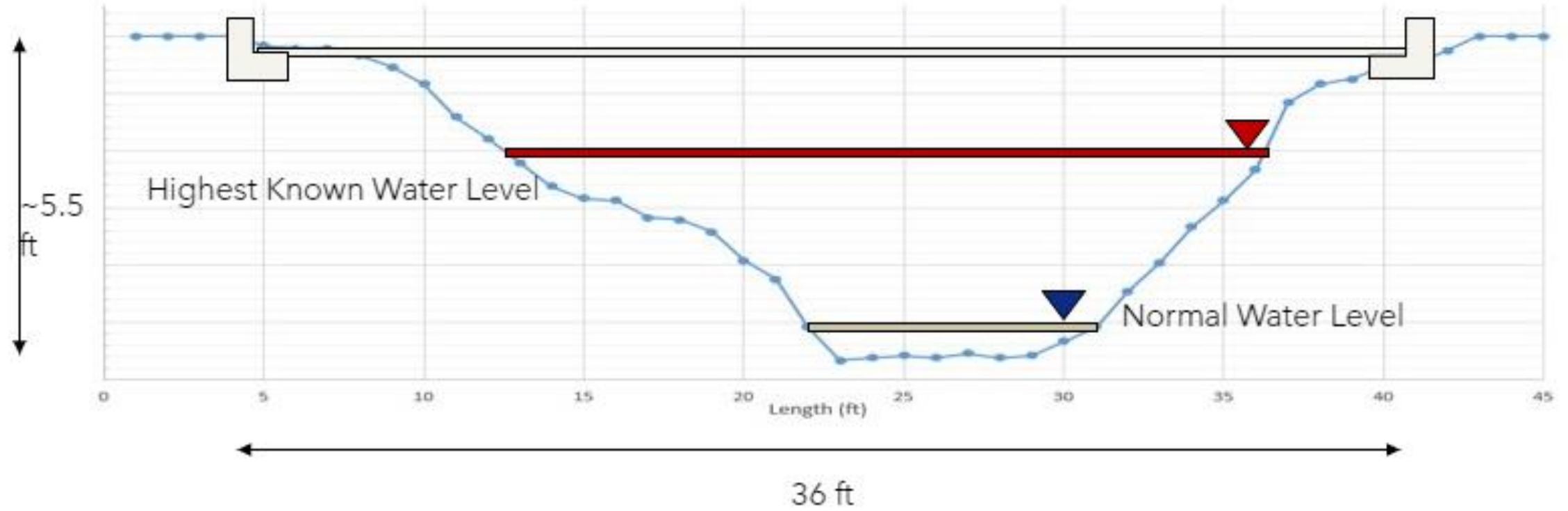
Looking Forward

- Selection and completion of 1 design option
- Construction

Site Visit



Site Visit



Pine Post Testing



Glue Laminated Beams



Pros

- **Estimated Total Cost:**
 - \$10,507 for a 2-member bridge
 - \$13,162 for 4-member bridge
- **Natural wood aesthetic**
- **Easier constructability for 4-member bridge**
- **Low maintenance**

Cons

- **Higher maintenance for 2-member bridge**
- **Construction effort/time higher for 2-member bridge**
- **Shorter lifespan than steel**
 - ~60 years

Steel Wide Flange



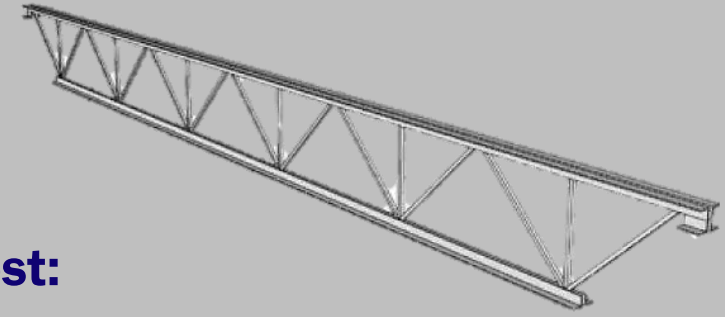
Pros

- **Estimated Total Cost**
 - \$11,165 for a 2-member bridge
 - \$12,377 for 4-member bridge
- **Greater expected lifespan ~ 100years**
- **Low maintenance**
- **Maintain wood aesthetic**

Cons

- **Decreased material workability**
- **Increased construction complexity**

Open Web Steel Joist



Pros

- **Estimated Total Cost:**
 - \$5,329
- **Lightweight (Best for Span Length)**
- **Easy Installation**

Cons

- **Increased Maintenance**
- **Little Natural Wood Aesthetic**
- **Increased Soil Excavation**

Summary & Analysis

	Glue Laminated	Steel Wide Flange	Open Web Steel Joist
Cost	4	4	5
Aesthetic	5	4	2
Maintenance	5	4	3
Construction	3.5	2	4
Total			

RECOMENDATION

4 Glue Laminated Beams

w/ pine wood posts sourced from Palmer Lake

